

CLAIMS

We claim:

1. In a computer system with a video encoder, a method for regulating level of a buffer storing compressed video information for the video encoder, the
5 method comprising:

determining a level of a buffer for a video encoder, the buffer storing compressed video information; and

based upon the determined level of the buffer, adjusting median filtering of video information.

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2. The method of claim 1 wherein a kernel defines a neighborhood of values for the median filtering, and wherein the adjusting comprises changing the kernel based upon the determined level of the buffer.

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3. The method of claim 2 wherein the changing comprises:
if the determined level is within a first range, selecting a first kernel; and
if the determined level is within a second range, selecting a second kernel.

4. The method of claim 1 wherein the adjusting comprises changing a
20 number of times for the median filtering of the video information.

5. The method of claim 1 wherein the determining and the adjusting occur on a frame-by-frame basis for the video information.

6. The method of claim 1 wherein the video information includes a prediction residual.

5 7. The method of claim 1 wherein the video information includes intra-coded pixel data.

8. A computer readable medium storing instructions for causing a computer programmed thereby to perform the method of claim 1.

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9. In a video encoder, a bitrate adaptive median filter for video information, the bitrate adaptive median filter comprising:

means for selecting a kernel for median filtering video information, the kernel defining a neighborhood of values for the median filtering, the selecting
15 based upon bitrate of previously compressed video information; and

means for applying the selected kernel to the video information for the median filtering, wherein the means for applying produces filtered video information.

20 10. The bitrate adaptive median filter of claim 9 wherein the filter controls bitrate in conjunction with means for adaptively quantizing the filtered video information and means for adaptively dropping compressed video information for one or more frames.

11. The bitrate adaptive median filter of claim 9 further comprising:
means for buffering the previously compressed video information, wherein
the bitrate of the previously compressed video information affects fullness of the
5 means for buffering.

12. The bitrate adaptive median filter of claim 9 wherein the video
information includes a prediction residual.

10 13. A computer readable medium storing instructions for causing a
computer programmed thereby to perform a method of regulating lossy
compression of video information in a video encoder, the method comprising:
during lossy compression of a set of video information, intermittently
changing a kernel for filtering the set of video information, wherein the kernel
15 defines a neighborhood of values for the filtering, the kernel selected from plural
available kernels including at least a first kernel and a second kernel, the first
kernel for decreasing quality and bitrate, and the second kernel for preserving
quality and increasing bitrate; and
using the kernel to filter the set of video information.

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14. The computer readable medium of claim 13 wherein each of the
plural available kernels is a median filter kernel.

15. The computer readable medium of claim 13 wherein the changing is based upon a quality constraint for the set of video information.

16. The computer readable medium of claim 13 wherein the changing is
5 based upon a bitrate constraint for the set of video information.

17. The computer readable medium of claim 13 wherein the set of video information includes video information for a video object.

10 18. A computer readable medium storing instructions for causing a computer programmed thereby to perform a method of controlling bitrate of information in an encoder, the method comprising:

receiving a bitrate indicator for filtering a set of information, the received
bitrate indicator indicating a bitrate goal for the set of information, the bitrate
15 indicator based upon level of a buffer; and

based upon the received bitrate indicator, adjusting kernel-based filtering of the set of information, wherein a kernel defines a neighborhood of values for the kernel-based filtering.

20 19. The computer readable medium of claim 18 wherein the filtering is median filtering.

20. The computer readable medium of claim 18 wherein the adjusting comprises changing the kernel based upon the received bitrate indicator.

21. The computer readable medium of claim 18 wherein the adjusting
5 comprises changing a number of times for the filtering of the information.

22. The computer readable medium of claim 18 wherein the set of information includes a prediction residual.

10 23. The computer readable medium of claim 18 wherein the set of information is for a video sequence, and wherein the receiving and the adjusting occur for each new set of information for the video sequence.

24. In a computer system, an encoder with a bitrate adaptive filter for
15 filtering information, the encoder comprising:

a bitrate adaptive filter for filtering information;

a frequency transformer for transforming filtered information into the frequency domain;

a quantizer for quantizing frequency transformed information;

20 an entropy coder for entropy coding quantized information; and

a buffer for buffering entropy coded information, wherein the bitrate adaptive filter adjusts filtering in relation to level of the buffer.

25. The encoder of claim 24 wherein the bitrate adaptive filter is a
bitrate adaptive median filter.

26. The encoder of claim 24 wherein the quantizer is a bitrate adaptive
5 quantizer.

27. The encoder of claim 26 wherein the information is for plural frames
of a video sequence, and wherein the encoder drops information for one or more
of the plural frames when the buffer approaches fullness.

28. The encoder of claim 24 wherein a kernel defines a neighborhood of
values for the bitrate adaptive filter, and wherein the bitrate adaptive filter adjusts
filtering by changing the kernel based upon the level of the buffer.

29. The encoder of claim 24 wherein the video information includes
15 intra-coded pixel data and prediction residuals.